



ELAC 
SONAR

A COHORT PLC COMPANY

PILOS 2.0

PASSIVE SONAR SYSTEM FOR DISTRESS LOCALISATION

PILOS 2.0 is a broadband passive sonar designed specifically for surface vessels to detect and track underwater noise and signals generated by sonar systems, emergency beacons and other acoustic sources. PILOS 2.0 significantly reduces the time taken to locate a submarine in distress by providing accurate bearing information and a large search radius, even on a rescue vehicle operating at high speed.

elac-sonar.de

Sphere 

AN INDISPENSABLE ASSET TO ANY SEARCH AND RESCUE MISSION

PILOS 2.0 is equipped with a sophisticated circular array providing full 360 degree coverage over a frequency range of 1 to 50 kHz. Through the use of a target tracking algorithm, it is possible to simultaneously visualise the bearing of multiple noise sources. In addition to the broadband trackers, PILOS 2.0 features frequency based narrowband trackers. These allow the user to specify a frequency range and to detect and track pingers in a selected frequency range only.

To further increase the chance of detecting an emergency pinger, even in the most noise polluted environments, PILOS 2.0 features a full-fledged frequency analysis system. The initial detection of slow pingers is supported by a transient analysis. Once detected, the pulse parameters are evaluated by the intercept processing and can be cross-referenced to the emergency pinger parameters.

PILOS 2.0 offers a detection range of up to 70,000 metres for signals generated by an emergency sonar beacon system (also available from ELAC SONAR). With the capability to receive underwater telegraphy and telecommunication signals, PILOS 2.0 is an indispensable asset to any search and rescue mission.

An integrated audio module operating on beam formed data supports the operator in classifying acoustic underwater signals. The signal received on an operator selected beam is transposed into the audible range around 800 Hz – equivalent to the highest sensitivity of the human ear. The audio channel can also be linked to a tracker. PILOS 2.0 offers a raw data recording capability. During playback all processing parameters can be changed. This feature is useful for training of the crew, analysis of data collected during surveillance operations or preservation of evidence during rescue missions. The transducer array is mounted on a hoisting gear and can be completely retracted into the ship's hull. The hoisting gear is operated from within the graphical user interface. Direct access is only required for maintenance and installation.

The open-architecture-based middleware of the PILOS 2.0 reduces the burden on the customer to integrate additional functionalities. These can be developed by the customer themselves or it might be a 3rd party functionality from another supplier.

Main benefits

- ✔ detection of pingers, tappers and other noise sources
- ✔ tracking of noise sources attached to underwater vehicles
- ✔ survey of underwater rescue missions (divers, ROV, AUV)
- ✔ detection and tracking of submarines over long distances
- ✔ broadband passive sonar
- ✔ 360° operation
- ✔ raw data recording and reprocessing for training or post mission analysis
- ✔ underwater telephone receiver built in array to further enhance the detection range in rescue missions
- ✔ available as a standalone or fully integrated version by consequential use of open architecture middleware based on OpenDDS
- ✔ sonar performance prediction of the day for accurate situational awareness
- ✔ performance monitoring and fault localisation (PMFL) down to LRU level
- ✔ suited for new built programs and refits

Key features

- ✔ broadband & narrowband tracking
- ✔ automatic detection & tracking
- ✔ intercept & transient analysis
- ✔ frequency analysis system
- ✔ retractable transducer array

AN UNBELIEVABLE TECHNOLOGICAL ADVANTAGE FOR EVERY SONAR

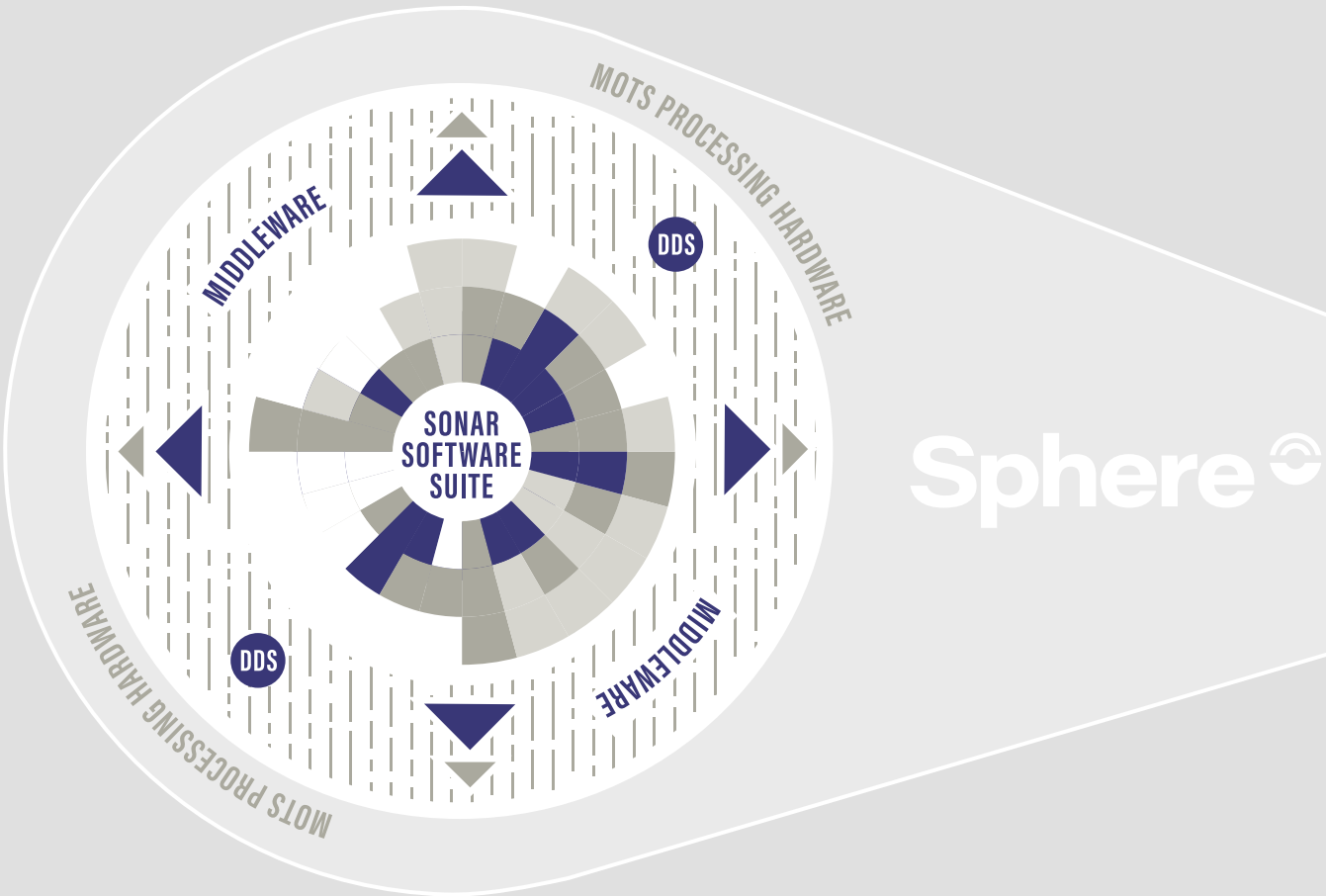


Sphere® by ELAC SONAR is the answer to all requirements in surveillance, mine & collision avoidance, underwater communication and measurement. We no longer think sonar technology in products but in holistic solutions, completely driven by customers' needs. We focus on simplicity, scalability and interoperability. Sphere® integrates formerly separated sonar systems into one versatile unitary system.

Learn more about Sphere® technology at elac-sonar.de.

SPHERE® – UNIMAGINABLE DIMENSIONS OF APPLICATION FLEXIBILITY

Due to its revolutionary architecture, Sphere® by ELAC SONAR enhances classical sonar systems like PILOS 2.0 to a whole new level. The data centric approach of Sphere® technology inside PILOS 2.0 decentralises huge parts of the system and makes it incredibly flexible for customers.



OpenDDS Middleware
The data centric system model uses OpenDDS as middleware. All applications running within Sphere® publish data to the ship's network or subscribe to data from the ship's network. The data distribution is completely handled by the OpenDDS middleware.



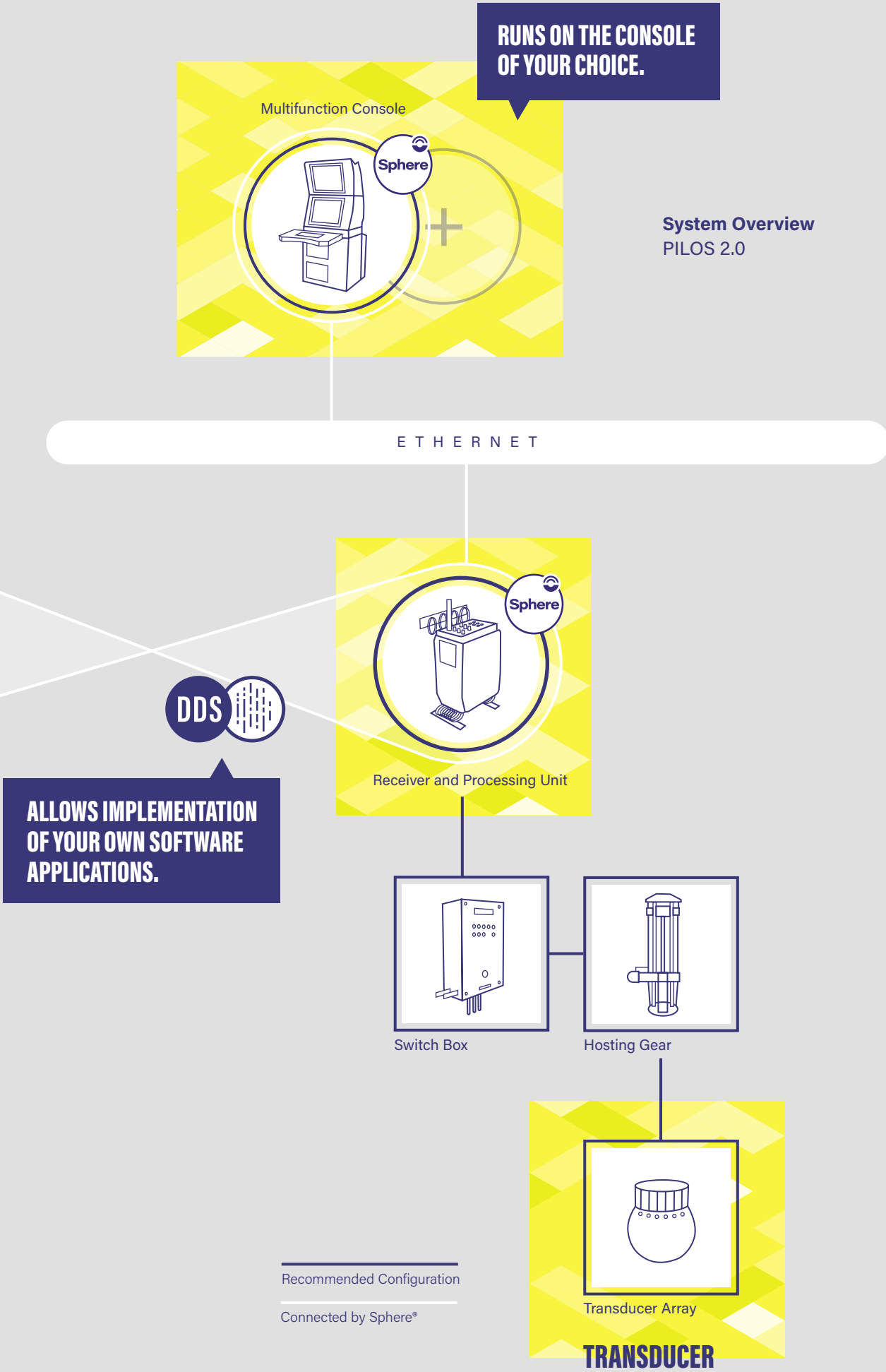
Open Architecture Sonar Sphere®
Due to the data centric system model, new applications can easily be added by the customer or 3rd parties. The new apps can subscribe to data at any stage of the signal processing.



MOTS Processing Hardware
The signal processing of Sphere® is able to run within virtual machines on COTS/MOTS hardware components. Sphere® is independent from the hardware platform. New software applications can be installed anywhere within the ship's network. This also includes customer hardware.



Cyber Security
Open Architecture does not mean your data can be accessed by anyone. Cyber Security is reached by network security, virtualisation and data encryption, not by putting data into boxes.



TECHNICAL DATA

Performance Data

Frequency range	1 kHz - 50 kHz
Receiving sector	360°
Horizontal beam widths: (-3 dB beam width)	approx. 25° @ 7.5 kHz approx. 14° @ 15 kHz approx. 7° @ 30 kHz approx. 5.5° @ 45 kHz
Vertical beam widths: (-3 dB beam width)	approx. 59° @ 7.5 kHz approx. 31° @ 15 kHz approx. 16° @ 30 kHz approx. 11° @ 45 kHz
Target trackers:	16 broadband tracker 16 narrowband tracker
Bearing accuracy (1-sigma)	$\leq 2.0^\circ$ @ 30 kHz
Dynamic range	> 160 dB
Frequency analysis	1 kHz - 50 kHz with 100 Hz resolution
History display	10 / 30 / 60 min